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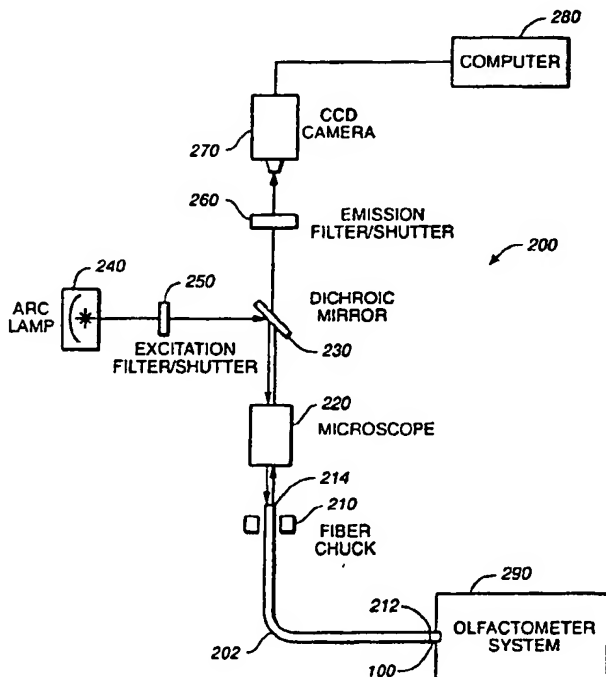
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : G01N 21/64, 21/77		A3	(11) International Publication Number: WO 00/13004
			(43) International Publication Date: 9 March 2000 (09.03.00)
(21) International Application Number: PCT/US99/19624		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).	
(22) International Filing Date: 26 August 1999 (26.08.99)		Published With international search report.	
(30) Priority Data: 09/140,352 26 August 1998 (26.08.98) US		(88) Date of publication of the international search report: 8 June 2000 (08.06.00)	
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(54) Title: COMBINATORIAL POLYMER SYNTHESIS OF SENSORS FOR POLYMER-BASED SENSOR ARRAYS

(57) Abstract

A combinatorial synthesis method for fabricating unique families of discrete copolymer sensors and copolymer gradient sensors is provided. The method employs combinatorial copolymer synthesis of discrete monomer or oligomer combinations as well as spatially-varying combinations for generating large numbers of analyte-discriminating sensors from a limited selection of initial monomer and oligomer compositions. The method can be applied to either analyte-specific sensors or sensor arrays or semi-selective sensors and cross-reactive sensor arrays which employ virtually any known physicochemical transduction mechanism for detecting analytes. Since the analyte response characteristics of such copolymer sensors are not limited to a linear proportional ratio of the monomer or oligomer combinations employed, the resulting copolymer sensors provide for increased diversity in sensor and sensor array response characteristics for discriminating between a variety of materials and for detecting and identifying analytes in fluid samples.



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INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 601N21/64 601N21/77		International Application No PCT/US 99/19624
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 7 601N		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	WO 99 00663 A (DOLEMAN BRETT ; SANNER ROBERT (US); GRUBBS ROBERT H (US); LEWIS NAT) 7 January 1999 (1999-01-07) page 10, line 29 -page 11, line 9 claims 1,176 -/-	1,3,5-7, 9,11-14
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
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Date of the actual completion of the international search 1 March 2000		Date of mailing of the international search report 08/03/2000
Name and mailing address of the ISA European Patent Office, P.B. 5018 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3018		Authorized officer Krametz, E

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Intern. Application No
PCT/US 99/19624

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	M C LONERGAN: "ARRAY-BASED VAPOR SENSING USING CHEMICALLY SENSITIVE, POLYMER COMPOSITE RESISTORS" IEEE AEROSPACE APPLICATIONS CONFERENCE. PROCEEDINGS, XX, XX, no. 3, 8 February 1997 (1997-02-08), pages 583-631, XP002078726 page 587, left-hand column, paragraph 3 -right-hand column, paragraph 2 page 590, left-hand column, paragraph 3 -right-hand column, paragraph 2	1,7,13
Y		3-6, 9-12,14
Y	US 5 244 636 A (WALT DAVID R ET AL) 14 September 1993 (1993-09-14) cited in the application column 4, line 53 -column 7, line 9 column 10, line 44 - line 56	3-6, 9-12,14
A		1,7,13
A	EP 0 572 157 A (PURITAN BENNETT CORP) 1 December 1993 (1993-12-01) page 3, line 55 -page 4, line 59 figure 1	4-6, 10-12
A	DICKINSON T A ET AL: "GENERATING SENSOR DIVERSITY THROUGH COMBINATORIAL POLYMER SYNTHESIS" ANALYTICAL CHEMISTRY, US, AMERICAN CHEMICAL SOCIETY. COLUMBUS, vol. 69, no. 17, 1 September 1997 (1997-09-01), pages 3413-3418, XP000720847 ISSN: 0003-2700 cited in the application page 3414, left-hand column, paragraph 3 -page 3417, right-hand column, paragraph 3	1,3,5-7, 9,11-14
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/19624

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9900663	A	07-01-1999	AU 8175598 A	19-01-1999
US 5244636	A	14-09-1993	US 5244813 A	14-09-1993
			US 5320814 A	14-06-1994
			US 5250264 A	05-10-1993
EP 0572157	A	01-12-1993	US 5266271 A	30-11-1993
			CA 2095414 A	23-11-1993
			JP 6058880 A	04-03-1994

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